

# Endowment for a rainy day? An empirical analysis of endowment spending by operating public charities

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## Abstract

There has been growing public attention to the accumulation and spending of endowments in recent years. Scholars have offered different theories on the objective of endowments that have different implications for endowment spending. Yet, there are limited empirical studies and they mostly focus on universities. Using the Form 990 data between 2009 and 2016, this study examines how endowments are actually spent for four types of operating charities, including museums, universities, hospitals, and K-12 schools. The descriptive results show that there are considerable cross-sectional differences in endowment characteristics across these types of organizations. The fixed effects analyses further demonstrate different types of organizations have different payout responses to changes in endowment returns, non-endowment income, and contributions to endowment. However, the study does not find any empirical evidence that organizations use endowments as rainy day funds. This article extends the understanding on endowment spending behavior from universities to other types of operating charities that also hold endowments. The findings provide empirical evidence that may inform the existing debate on endowment spending and have practical implications for endowment management.

**KEYWORDS**

endowment management, endowment payout, endowment returns, endowment spending, nonprofit finance

## 1 | INTRODUCTION

The accumulation and spending of endowments have been under public scrutiny for years. For instance, the media has criticized rich elite universities with large endowments for being stingy with financial aid for low-income students (e.g., Lewin, 2008; Zinshteyn, 2016). Following various policy proposals in recent years, the Congress passed Tax Cuts and Jobs Act of 2017, imposing a tax on the endowment earnings of a small number of private nonprofit colleges and universities (Baum & Lee, 2019).

The concern over endowment hoarding is especially evident during times of crisis. Taking several large institutions as examples (e.g., Harvard University, Yale University, J. Paul Getty Museum, the Shriners Hospitals for Children), Weisbrod and Asch (2010) point out that many nonprofits are taking the wrong approach in managing their endowments. Instead of using endowments as rainy day funds during the 2008 recession, they cut programs to preserve endowments.

With the COVID-19 pandemic causing tremendous financial challenges, endowed nonprofits are facing the same issue again: should they increase the rate of endowment spending to weather the storm? Some well-endowed universities still have no plans to use endowment funds to sustain financial losses during the pandemic (Thorbecke, 2020), while some cultural organizations have decided to tap more heavily into their endowments (Bowley & Jacobs, 2020).

Irvin (2007) suggests that it is prudent to conserve endowment assets now for future social benefits given the patterns of charitable giving and generational wealth transfers. However, she also admits that the decision to allow nonprofits to accumulate even larger endowments does not rest easily. Indeed, a true endowment always faces the dilemma between preserving the fund's real purchasing power over time for the benefits of future generations and meeting the needs of the current generation. It becomes a particularly challenging issue in times of crisis when both endowment returns and other revenues take a hit.

Existing theories offer different implications for endowment payout practice. Tobin (1974, p. 427) states that university endowments should be used in a way that "the existing endowment can continue to support the same set of activities that it is now supporting," independent of other income sources and prospects of future gifts. Different from this view, Merton's (1993) model treats endowment payouts as one of many revenue sources for a university, suggesting that endowments should be used to hedge against the overall financial risk.

Although there is abundant theoretical literature on how endowment *should* be spent, empirical research on how endowments *are* actually spent is limited. Understanding endowment spending behavior would provide insights for the ongoing theoretical inquiry and policy debate on the objectives and spending of endowment funds. There are only a few empirical studies on endowment spending and they mostly focus on university endowments (e.g., Brown, Dimmock, Kang, & Weisbenner, 2014; Brown & Tiu, 2014; Rosen & Sappington, 2019).

Besides universities, there are other types of nonprofits that also hold considerable endowment assets, such as museums, hospitals, independent schools, among others. Compared to universities, these organizations face different operating environments, have different business models and revenue portfolio characteristics (Qu, 2019), which may have an influence on their

endowment behavior. For example, museums generally have diversified operating revenue streams from private donations, government funding, and admission fees and sales (e.g., gift shops). While both private universities and K-12 schools are reliant on tuition, the former receive more non-tuition revenue (e.g., gifts, hospital revenue, sales, and services of educational activities). Nonprofit hospitals, facing direct competition from their for-profit counterparts, are perhaps the most commercialized type of nonprofits, and are also more reliant on debt to finance capital expenditures (e.g., equipment, facilities). Different types of organizations also differ in their dependence on endowment payouts, with arts and higher education nonprofits more reliant on endowment to support their annual expenses than other education nonprofits and hospitals (Calabrese & Ely, 2017). Therefore, this study separately examines the endowment spending of different types of nonprofits.

Building on prior research on university endowments and using a different dataset, the current study extends the understanding of nonprofit endowment spending behavior to several other types of organizations. It focuses on four different types of operating public charities that hold the most endowment wealth, including museums, universities, K-12 Schools, and hospitals. Using the Form 990 data filed electronically with the Internal Revenue Service (IRS) between 2009 and 2016, this study 1) uses descriptive analyses to examine the characteristics of endowments and highlight the heterogeneity in endowment behavior across types of organizations; and 2) employs fixed-effects regressions to examine whether organizations adjust their endowment spending responding to changes in endowment funds and operations. Specifically, are endowment payout rates associated with changes in endowment investment returns, other operating income, or contributions to endowment? The data cover a period of economic growth following the 2008 recession, when extreme financial challenges were probably less commonly experienced. However, with declining markets in 2011 and 2015, it is still meaningful to test if endowment payout rates respond differently to endowment returns.

The article proceeds as follow. It first provides an overview of endowment payout policies. It then reviews theoretical and empirical literature on endowment objectives and spending behavior, and present hypotheses. Next, it describes data, sample, and methodology. Third, it presents the descriptive and regression results. Finally, it concludes with a discussion on the empirical results and implications.

## 2 | BACKGROUND

### 2.1 | What is endowment?

Scholars have defined endowment differently. Some use the term more strictly to include only permanently restricted investment reserves (Hager, 2006), while others define it more broadly to encompass both long-term investment assets and board-designated operating reserves (Bowman, 2007). The official definition by American Institute of Certified Public Accountants (AICPA) refers to endowment as “an established fund of cash, securities, or other assets to provide income for the maintenance of a not-for-profit entity” (2013, p. 145). Typically, the endowment reported by a nonprofit on the IRS Form 990 (post-2008) is a combination of “true endowment” (permanently restricted net assets), “term endowment” (temporarily restricted net assets), and “quasi-endowment” (board-designated unrestricted funds). Therefore, this article defines endowment broadly as a collection of both restricted and unrestricted assets managed to provide an income stream for the current and future operations of a nonprofit organization.

## 2.2 | Endowment spending practice

### 2.2.1 | The law

Unlike private non-operating foundations, which are legally required by the IRS to distribute at least 5 % of their net investment assets annually, there are no laws governing how much operating charities should spend from their endowments. Nonetheless, the Uniform Prudent Management of Institutional Funds Act (UPMIFA), adopted in all states by 2012, provides general guidance to nonprofits on investment and spending of *permanently* restricted endowment funds. Different from its predecessor Uniform Management of Institutional Funds Act (UMIFA), UPMIFA allows nonprofits to spend from an “underwater” endowment (i.e., below the historic dollar value of an original gift) if the governing board determines it is prudent.

Specifically, when deciding to spend or accumulate, UPMIFA (2006) provides seven factors that an institution should consider besides the original donor intent, including:

the duration and preservation of the endowment fund; the purposes of the institution and endowment fund; general economic conditions; the possible effects of inflation or deflation; the expected total return from income and appreciation of investments, other resources of the institution; and the investment policy of the institution (p. 19).

Under the general legal guidance, the governing board of an endowed nonprofit decides the organization's endowment spending rules in its endowment investment policy statement.

### 2.2.2 | Spending rules

Sedlacek and Jarvis (2010) summarized four major types of spending rules used by university endowments that are also applicable to other types of nonprofits. These rules include simple rules, inflation-based rules, smoothing rules, and hybrid rules.

First, the simple rules refer to spending only current income (i.e., interest and dividends), or a pre-specified percentage of the endowment beginning market value, or deciding on an appropriate spending rate each year.

Second, some organizations use inflation-adjusted rules, that is, annual endowment spending grows at a pre-determined inflation rate (i.e., inflate last year's spending dollars by a price index) and may be bounded by lower and upper bands (e.g., between 3 and 6% of the endowment value). Compared to the moving average method described below, the banded inflation method is less volatile, allowing organizations to spend more (less) during falling (rising) markets.

Third, the majority of organizations spend a pre-specified percentage of the moving average of the past endowment market values (usually past 3 years or 12 quarters). Despite its goal of smoothing volatility in spending, the moving average method results in spending surge during strongly rising markets that increase endowment market values and spending cuts during sharply or sustained falling markets that decrease endowment values.

Finally, some organizations use hybrid spending rules (i.e., Yale/Stanford spending rule), where spending rate is based on a weighted average of both a moving average market value component and an inflation-adjusted component. Compared to the moving average method,

the hybrid method does not increase spending as high during rising markets, nor does it cut spending as deeply during severe market losses.

According to the Commonfund Institute studies on universities and colleges (2018) and independent schools (2018a), the predominant spending method among the participating institutions is the moving average method. Similar patterns are also found among a small sample of operating charities (Commonfund Institute, 2013). In addition, Brown and Tiu (2014) found that larger university endowments and those more dependent on endowment payouts for their operating budgets tend to use inflation-adjusted rules and hybrid rules, which are associated with larger average payout rates than other rules.

### 2.2.3 | Policy versus effective spending rate

The policy spending rate is specified in a nonprofit's endowment policy statement, and the effective spending rate is calculated as dividing the actual dollars spent in a year by the beginning endowment market value. Depending on the spending rule, an organization's effective spending rate can deviate from its policy rate and vary from year to year.<sup>1</sup> The study observes effective rates than policy rates.

## 3 | LITERATURE AND HYPOTHESIS

This section first introduces four theoretical models of endowment objectives and their implications on endowment spending. It then discusses the mixed empirical evidence on university endowment spending behavior. At the end of the section, it presents the hypotheses based on both the theoretical and empirical literature.

### 3.1 | Intergenerational equity

Competing theories regarding the goals of endowment funds have different implications for endowment spending behavior. According to Tobin's (1974) model, the trustees of an endowed institution are to preserve intergenerational equity so that "the existing endowment can continue to support the same set of activities that it is now supporting" (p. 427). It suggests that trustees decide payouts based on endowments alone, not affected by the prospect of future gifts to endowments or other current income streams. Similarly, Bowman (2007) suggested adopting an endowment spending formula that protects its real purchasing power over time, and warned against increasing spending above the policy payout rate even during a financial crisis. Building upon Tobin's model, subsequent research develops models that provide predictions on endowment spending behavior. For example, Dybvig's model (1999) additionally assumes that university endowments seek to avoid reducing payout amounts, suggests that the payout rate decreases following positive shocks to endowment returns and increases with negative shocks. Gilbert and Hrdlicka (2015) show that endowment payout rates should respond symmetrically, and of small magnitude, to both positive and negative shocks to endowment returns. Therefore, an endowment with the objective of preserving intergenerational equity may adjust its annual payout rate according to changes in endowment returns but not to changes in operating income.

### 3.2 | A rainy day fund

An alternative model suggests that the goal of endowments is to protect against adverse revenue shocks. In a discussion on why universities hold endowments, Hansmann (1990) noted that one of the most compelling reasons for endowment accumulation was to serve as a buffer against financial adversity. However, Hansmann (1990, p. 26) also noted that “there is little affirmative evidence that universities have viewed their endowments principally as buffers for their operating budgets, even during the severe financial crisis of recent years.” Following the 2008 recession, Weisbrod and Asch (2010) suggested that “nonprofits should treat at least some portion of their endowment as a rainy day fund, a source of money that is available to make up for those unexpected, yet predictable, times when income drops or demand for services increases.” Viewing an organization’s endowment fund in relation to its other sources of income potentially affect endowment investment portfolio choice (Black, 1976; Merton, 1993) and have implications for its spending policy. Under this model, organizations would spend more conservatively in good times for precautionary savings while quickly increase spending responding to negative income shocks (Conti-Brown, 2011). Thus, an endowment with the objective of serving as a rainy fund may increase the annual payout rate responding to negative shocks to operating income but not to positive operating income shocks or changes in endowment returns.

### 3.3 | Agency problems

Even if the stated goal of an endowment is to preserve integrational equity or serve as a rainy day fund, agency problems in endowment management may lead to behavioral deviations from the stated objective. Hansmann (1990) pointed out that the management and other stakeholders of a nonprofit might have preferences different from the stated endowment objectives. Later empirical research reports evidence of agency problems associated with endowments (using different proxies). For example, Fisman and Hubbard (2003, 2005) found that organizations in states with weaker government oversight allocated a higher proportion of inflows of donations for managerial compensation and a smaller proportion to endowment (i.e., net assets). Core, Guay, and Verdi (2006) found that nonprofit organizations with excess endowments (i.e., cash, savings, and investment securities) had lower program expenses but higher CEO pay and director compensation, although subsequent research reported weaker evidence supporting such a relationship (Calabrese & Gupta, 2019; Ramirez, 2011). The potential agency problems may offer an explanation on why the actual payout rate of an endowment may deviate from the stated endowment objective and policy spending rate.

### 3.4 | Endowment accumulation as an end itself

Additionally, simply having a large and growing endowment can be an objective itself (Hansmann, 1990), as institutions may use their endowments as “a symbol of prestige” and a measure of institutional success compared to their peers (Conti-Brown, 2011, p. 699). This implies that organizations may limit endowment spending, increase spending slowly (if at all) following positive endowment shocks to grow the endowment value while reduce spending after negative endowment shocks to control the damage to the endowment. Brown et al. (2014)

provided supporting empirical evidence. Naming this behavior “endowment hoarding,” they noted that university and endowment leadership might seek to maintain a large endowment for reasons beyond supporting university operations (e.g., prestige). Therefore, the payout rate of an endowment with this objective may decrease following negative endowment shocks while remaining unchanged following positive endowment shocks or changes in operating income.

### 3.5 | Empirical evidence on endowment spending

The empirical studies on endowment spending behavior have largely focused on universities. Two studies report mixed findings on the impact of endowment shocks on university endowment spending. Defining shocks as the difference between the actual and expected normalized endowment returns, Brown et al. (2014) found that universities actively reduced endowment payouts responding to negative contemporaneous endowment shocks but left their payouts unchanged following positive contemporaneous shocks between 1993 and 2009. They did not find consistent evidence that universities adjust endowment spending responding to revenue shocks. In contrast, Rosen and Sappington (2019) found that payout amounts responded symmetrically to positive and negative endowment shocks in the prior year, using the same data but a different measure for shocks (i.e., unexpected changes in endowment values). They did not examine revenue shocks in their analyses.

Additionally, Brown and Tiu (2014) found that half of the sample changed their spending policies at least once between 2003 and 2011. They found that large university endowments and funds with lower past returns and lower payout levels were more likely to change their spending policies, but those with the ability to use temporary special appropriations were less likely to do so. Noting contributions to endowment as an alternative way of funding spending needs, they found that it had a negligible effect on spending rule changes.

There is limited research on endowment spending for nonprofits other than universities. Dahiya and Yermack (2018) used the newly available endowment fund information from the IRS e-filer data and found that most endowments appear to spend conservatively between 2009 and 2017, with a median payout rate below 2.5%. While most tiny endowments made no distributions at all, larger endowments paid out about 4.5% of their endowment market value. However, their study did not examine the changes in endowment payout rates using panel data analysis.

The current study examines if changes in endowment payout rates are correlated with changes in endowment returns, non-endowment operating income growth, and contributions to endowment for other types of nonprofits besides just universities. Because the objective of an endowment is unknown, it is hard to predict the direction of payout responses for different types of organizations. Based on the competing theories of endowment objectives as well as the mixed empirical evidence on university endowment spending behavior, the two-tailed null hypotheses are formulated as follows:

*H1: Changes in endowment payout rates are not related to changes in endowment returns.*

*H2: Changes in endowment payout rates are not related to changes in operating income growth.*

*H3: Changes in endowment payout rates are not related to changes in contributions to endowment.*



## 4 | DATA AND SAMPLE

### 4.1 | Data cleaning

This study uses data from the IRS Forms 990 filed electronically by 501(c)(3) public charities between 2009 and 2016, which are posted by the IRS on Amazon Web Services. Organizations' endowment fund information is available via Schedule D Part V and other information is from the core file. The data collection started with obtaining all organization-year observations with information on Scheduled D Part V, which identified all endowed public charities that have e-filed with the IRS. Then, each organization's annual endowment fund information was merged with its corresponding core file.

#### 4.1.1 | Cleaning schedule D

Dahiya and Yermack (2018) offer helpful guidance for cleaning Schedule D data. The initial sample included 205,339 organization-year observations with Schedule D Part V Endowment Funds information. After replacing missing values with later filings of historical data,<sup>ii</sup> as well as excluding duplicate reports and non-public charities, there were 226,257 observations. Further cleaning focused on Line 1 items on Schedule D Part V, which include (a) beginning of year balance, (b) contributions, (c) net investment earnings/gains/losses, (d) grants or scholarship, (e) other expenditures for facilities and programs, (f) administrative expenses (if investment earnings are reported on a gross basis), and (g) end of year balance.

First, reports with negative contributions were dropped. The negative values for expense items—grants or scholarships, other expenditures for facilities and programs, and administrative expenses—were replaced with their absolute values.

Second, following Dahiya and Yermack (2018), reports were excluded if their beginning or ending balance was missing, zero, or negative because they were likely to represent cases in which organizations either just created or liquidated their endowments. Moreover, reports with zero investment earnings, gains, or losses were excluded because they were likely to be endowments with only illiquid assets that did not make investment returns and/or distributions annually.

Third, the difference between beginning and ending endowment balance should be equal to the difference between the input to the endowment (contributions plus investment earnings/gains/losses minus administrative expenses) and withdrawals from the endowment (grants plus other expenditures) (Dahiya & Yermack, 2018). However, this was not the case for all filings, suggesting reporting errors. Therefore, those with discrepancies larger than 1% of the beginning endowment balance were dropped.

Fourth, very small endowment funds, those with less than \$10,000 in beginning balance, were excluded because of the immaterial fund size and because they tend to skew the sample with extremely small or large returns on endowment.

Finally, there were some extremely large or small annual returns on endowment investment. Following Dahiya and Yermack (2018), the top and bottom 0.1% of the observations for returns were dropped to avoid the undue influence of these outliers on the results. Moreover, to observe within-organization variations in both contemporaneous and lagged annual returns, I required at least 3 years' observations for annual returns per each organization, thus organizations with only one- or two-year returns were excluded. After the above cleaning process, the endowment fund sample included 165,500 observations.<sup>iii</sup>



### 4.1.2 | Cleaning core file

The cleaned endowment fund sample was then merged with the corresponding core files. There were 151,772 observations with both endowment fund information and core files. Following prior research (e.g., Bowman, Tuckman, & Young, 2012; Calabrese, 2013), observations with negative gross revenue items (i.e., contributions, program service revenue), those with no total expenses, and those with negative or zero assets were excluded. Reports that were group returns for affiliates and those operating in non-US states were also excluded. Additionally, to observe within-organization variations in both contemporaneous and lagged non-endowment income (i.e., other sources of income that are not distributed from or transferred to endowment), organization with less than 3 years' annual growth rates of non-endowment income were excluded. Finally, trusts, supporting organizations, foundations, mutual benefit organizations (e.g., insurance providers, pension & retirement funds), and other similar organizations were out of scope for this study. After the above cleaning process, the sample included 99,253 observations.

## 4.2 | Sample selection

This study further selected four types of operating public charities that hold considerable endowment assets, including museums (NTEE A50-A57), universities (B40-B43), K-12 schools (B20-29), and hospitals (E20-24).

The sample selection was, first of all, informed by prior research that report varying endowment behavior across types of organizations. For example, Calabrese and Ely (2017) find that different types of organizations differ in their dependence on endowment payouts. The Commonfund Institute (2018b) reports institutional differences in endowment asset allocation, which largely drives the variations in investment returns. On average, colleges and universities allocate over half of their investment portfolios to alternative assets (relatively illiquid and more risky than traditional equity investments) and the least proportion to fixed income and short-term investments, while health care organizations allocate the highest proportion to fixed income and only a quarter to alternative assets. In addition, Qu (2020) finds that the association between background risk (i.e., volatility of non-endowment income) and endowment portfolio volatility is significantly negative for universities, but not for other types of operating charities, implying different endowment objectives and asset allocation strategies across types of organizations. Therefore, mixing all types of organizations together in one analysis may obscure important differences among them.

The sample selection was based on both the significance of endowment assets (i.e., which subsector/types of organizations had the most endowment assets) and the prevalence of endowment funds (i.e., which subsectors/types had the largest number of endowed organizations). Calabrese and Ely (2017) find that although endowments exist in all major nonprofit subsectors, the majority of the endowment assets were owned by higher education nonprofits (63.7%), followed by other education nonprofits (7.7%), hospitals (7.3%), and arts organizations (5.1%) in 2012. In the current study, arts, culture, and humanities organizations accounted for nearly 16% of the cleaned sample, education organizations (both higher education and other education) made up 23%, and health organizations 11%.<sup>3</sup> Each major group, however, represents a broad subsector that includes different types of nonprofits. For example, both museums and university presses belong to the arts and culture group, universities, preschools, and parent & teacher

groups are all in the education group, and hospitals and blood banks in the health group. Therefore, instead of analyzing the major groups, mixing apples, and oranges, this study focuses on specific types of organizations within each subsector that hold the most endowment assets, that is, museums, universities, K-12 schools, and hospitals.

## 5 | EMPIRICAL MODEL AND VARIABLES

A fixed effects model is used to examine if the changes in annual endowment payout rates are related to contemporaneous and lagged changes in endowment investment returns, non-endowment operating income, and contributions to endowment. The model is described as follows:

$$\begin{aligned} \text{Payout Rate}_{i,t} = & \beta_1 \text{ROI}_{P,i,t} + \beta_2 \text{ROI}_{N,i,t} + \beta_3 \text{ROI}_{P,i,t-1} + \beta_4 \text{ROI}_{N,i,t-1} + \beta_5 \text{Rev Growth}_{P,i,t} \\ & + \beta_6 \text{Rev Growth}_{N,i,t} + \beta_7 \text{Rev Growth}_{P,i,t-1} + \beta_8 \text{Rev Growth}_{N,i,t-1} \\ & + \beta_9 \text{Contri Endow}_{i,t} + \beta_{10} \text{Contri Endow}_{i,t-1} + Z_i + \delta_t + \varepsilon_{i,t} \end{aligned}$$

### 5.1 | Dependent variable

The dependent variable is the actual payout rate of organization  $i$  in year  $t$ . Specifically, the annual payout amount is the sum of “grants or scholarships” and “other expenditures for facilities and programs” reported on Form 990 Schedule D (Calabrese & Ely, 2017). And the annual payout rate is calculated as the payout amount divided by the beginning endowment balance.

### 5.2 | Independent variables

#### 5.2.1 | Endowment returns

Whether spending a percentage of the income return or total return, the endowment spending rules reviewed earlier show that endowment returns appear to be an important factor of endowment spending. The question is: do organizations spend more (or less) than usual when experiencing a windfall (or unexpected loss in returns)? Prior studies provide mixed evidence on how universities respond to negative and positive “shocks” to endowment returns (Brown et al., 2014; Rosen & Sappington, 2019). Both studies cover a long period that includes two recessions (2001–2002 and 2008–2009), making it feasible to examine payout responses to shocks. Due to data availability, the current study only observes the post-recession years between 2009 and 2016. Therefore, this paper focuses on changes in endowment returns rather than shocks. Nonetheless, with declining markets in 2011 and 2015, it is still meaningful to test if endowment payout rates respond differently to endowment returns.

The annual return on endowment investment (ROI) is calculated as “net investment earnings, gains, and losses” divided by the beginning endowment balance. Taking a similar approach by Brown et al. (2014), the annual returns are decomposed into positive returns ( $\text{ROI}_P$ ) and negative returns ( $\text{ROI}_N$ ) to allow for examinations of possible asymmetric payout

responses. For example, an organization may adjust its payout rates in response to changes in negative endowment returns but not to positive returns, or the other way around.

$$ROI_P = \max[0, ROI_P]$$

$$ROI_N = \min[ROI_N, 0]$$

### 5.2.2 | Non-endowment income growth rates

The annual growth rates of non-endowment income are included to test the objective of endowments as a rainy day fund in explaining endowment spending, that is, whether endowment payout rates increase with decreasing operating income. Including this variable also controls for any changes that might be correlated with the changes in endowment returns. The non-endowment operating income variable is constructed as contributions and grants (core file, Part I, line 8) plus program service revenue (core file, Part I, line 9) and other revenue (core file, Part I, line 11) minus contributions to endowment (Schedule D, Part V, line 1b), excluding investment income (core file, Part I, line 10). As in the case of endowment returns, the annual growth rates of non-endowment income are also decomposed into positive and negative parts.

$$RevGrowth_P = \max[0, RevGrowth_P]$$

$$RevGrowth_N = \min[RevGrowth_N, 0]$$

As explained by Brown et al. (2014), it is an econometric dilemma to include or exclude the non-endowment income growth variables in the fixed effects model. On the one hand, if the income growth variables are endogenous, including them in the model would bias their coefficients. It is possible that an organization adjusts its revenue-generating strategy when expecting changes in endowment spending in coming years.<sup>iv</sup> Nonetheless, it may take longer than a year for a nonprofit to change its revenue structure and/or for that change to effectively address endowment spending decrease. Moreover, because the sample of public charities rely more on other types of operating income than endowment income, it is reasonable to assume that nonprofits typically do not adjust their revenue structure according to their anticipated changes in endowment spending or performance but the other way around. On the other hand, if excluding these income growth variables, and they are correlated with both the endowment payout and return variables, then the model has an omitted variable problem that would bias the coefficients on the return variables. Therefore, I run the specifications without and with non-endowment income growth as robustness checks. Results show that including the non-endowment income variables do not change the coefficients on the investment return variables in all specifications, thus mitigating the endogeneity concerns.

### 5.2.3 | Contributions to endowments

Endowment returns are not the only source of endowment spending.<sup>v</sup> Nonprofits may also receive donations to their endowments, either as restricted gifts that increase the size of current endowments, or as pass-through gifts that are earmarked for direct expenditure (e.g., Brown,

Dimmock, & Weisbenner, 2012; Brown & Tiu, 2014). In the former case, organizations using the moving-average spending rule may experience a decreasing payout rate following an increased endowment balance. In the latter case, we expect an increasing payout rate due to increased payout amounts and generally unchanged endowment balance. Additionally, organizations with contributions to endowment that support current expenditures may also be less responsive to changes in endowment returns or non-endowment income, due to the additional funding source. Contributions to endowments are expressed as a percentage to endowment beginning balance.

### 5.2.4 | Lagged independent variables

There are reasons to believe that endowment payout responses may operate with a lag. For example, for organizations following a moving-average spending rule, a change in the endowment value in the current year should affect future payouts. Organizations may also plan for their operational budgets based on prior year's operating income. Therefore, the model includes both contemporaneous and lagged variables.

### 5.2.5 | Fixed effects

The model includes organizational fixed effects  $Z_i$  to account for any unobservable time-invariant characteristics of an organization that may affect its endowment spending, such as the adopted endowment spending rules and stated endowment objectives. The model also includes the time fixed effects  $\delta_t$  to control for factors that affect all organizations' decisions in a given year, such as the general economic conditions and the state of financial markets.<sup>vi</sup>

## 6 | DESCRIPTIVE RESULTS: CHARACTERISTICS OF ENDOWMENTS

Before turning to regressions, this section presents the descriptive results on the characteristics of the endowed nonprofits. We first review two special cases—zero payout and very high payout rates, and then present the sample statistics.

### 6.1 | Zero payout

Notably, over 20% of the organization-year observations reported zero payout between 2009 and 2016. By type of organizations, the percentage of organization-year observations with zero payout is much smaller for universities (8.3%) than museums (25.4%), K-12 schools (27.1%), and hospitals (29.0%). On average, compared to the organizations that never reported zero payout during the sample period, those with zero payout in at least 1 year has much smaller endowment funds, lower endowment returns, smaller payout amounts, lower average annual payout rates, and higher volatility of annual payout rates (Table 1). The differences in all these variables between the two groups are statistically significant ( $p < .001$ ). These results corroborate the findings by Dahiya and Yermack (2018), who reported that over a third of their sample made no payouts at all and most were tiny endowments.

**TABLE 1** Characteristics of endowments by organizations reporting zero payout or not, 2009–2016

Zero payout in any year	Endowment beginning balance (\$ M)	Annual payouts (\$ M)	Annual payout rates	Volatility of annual payout rates	Endowment returns	N
No	187	9.5	5.9%	2.9%	7.5%	15,059
Yes	19.8	0.45	4.5%	7.1%	5.7%	9,671

*Note:* Dollar amounts are inflation adjusted to 2017 dollars. The reported numbers represent the mean values.

Most of the spending rules described previously has a goal of limiting spending volatility. Obviously, paying out in some years but not in others makes endowment distributions an unstable income stream for organizations. One might ask under what circumstances an endowment pays out nothing. Although the data provide no direct answers, there are several possibilities. It could be that the organization, especially when its endowment fund is small, has not established a spending rule but decides its payout on a casual basis. It could be that smaller endowments use a different strategy, making no distributions before their endowment funds accumulate to a critical mass (Dahiya & Yermack, 2018). It is also possible that the organization chooses not to spend when its endowment fund is underwater, despite that the UPMIFA permits such spending. This study examines organizations with a stable spending policy, thus excluding the organizations that reported zero payout in any year (1,449 organizations, 9,671 organization-year observations).

## 6.2 | High payout rates

Besides zero payout, there are also some very high payout rates. The median payout rates are relatively close for the four types of organizations, ranging from 4.3% for universities and 4.9% for museums. However, the average payout rates vary quite a bit, from 5.1% for universities to 12.3% for hospitals. In particular, hospitals have much lower payout rates at the lower quartile (below 2%) than other types of organizations, but much higher payout rates at the higher quartile (over 13%).

A payout rate of 50%, for example, is unusual. The high payout rates in the sample may be partly due to how endowment balances and distributions are reported on Form 990 Schedule D. The endowment balance is a total of an organization's perm endowment, term endowment, and quasi-endowment funds. The amounts distributed for facilities and programs include not only withdrawn amounts but also “amounts disinvested from an organization's quasi-endowments to reduce or eliminate capital investment” (The IRS, 2017, p. 4). In other words, the high payout rates may reflect not only the distributions directed by endowment spending policies but also changes in quasi-endowment funds. To avoid the undue influence by outliers, for each type of organizations, the regression analyses exclude organizations with a mean or standard deviation of payout rates at the top or bottom 1 % (1,392 observations).<sup>vii</sup>

## 6.3 | Characteristics of endowments and operations by type of organizations

Table 2 reports the characteristics of endowments and operations between 2009 and 2016 for the sample of organizations ( $N = 15,059$ ), including museums ( $n = 297$  organizations), universities ( $n = 787$ ), hospitals ( $n = 366$ ), and K-12 schools ( $n = 620$ ).

**TABLE 2** Characteristics of endowments and operations by type of organizations, 2009–2016

Variables	Type	Mean	Median	SD
Endowment fund size				
Endowment beginning balance (\$ M)	Museums	56.7	7.9	193
	Universities	393	49.3	1890
	Hospitals	82.4	11.1	424
	K-12 schools	31.8	9.3	79.7
Endowment-to-expense	Museums	3.37	2.45	3.15
	Universities	1.14	0.68	1.48
	Hospitals	0.21	0.04	0.94
	K-12 schools	1.19	0.72	1.52
Endowment payout				
Payout amount (\$ M)	Museums	2.96	0.41	10.10
	Universities	19.20	2.22	93.90
	Hospitals	6.20	0.57	29.40
	K-12 schools	1.61	0.41	3.91
Payout rate (%)	Museums	6.2	4.9	5.7
	Universities	4.8	4.3	3.6
	Hospitals	9.0	4.3	11.8
	K-12 schools	5.5	4.3	5.5
Payout-to-expense	Museums	0.20	0.13	0.26
	Universities	0.06	0.03	0.08
	Hospitals	0.01	0.002	0.04
	K-12 schools	0.06	0.03	0.09
Endowment returns				
Return on investment (%)	Museums	7.5	7.6	7.4
	Universities	8.0	9.2	7.7
	Hospitals	6.1	4.7	8.1
	K-12 schools	7.6	8.6	7.7
Contributions to endowment				
Contributions to endowment (%)	Museums	5.6	0.6	19.3
	Universities	4.9	2.4	17.7
	Hospitals	11.2	2.7	29.2
	K-12 schools	6.2	1.9	18.8
Organizational operations				
Growth rates of non-endowment income (%)	Museums	2.4	1.3	39.1
	Universities	2.0	1.9	11.6
	Hospitals	2.4	2.5	9.9
	K-12 schools	2.6	1.9	16.0
Non-endowment income (\$ M)	Museums	12.1	2.9	30.7
	Universities	213.0	72.1	569.0
	Hospitals	565.0	312.0	878.0

**TABLE 2** (Continued)

Variables	Type	Mean	Median	SD
Total expenses (\$ M)	K-12 schools	18.4	14.8	
	Museums	15.0	4.3	39.3
	Universities	229.0	75.4	626.0
	Hospitals	545.0	300.0	853.0
	K-12 schools	19.2	15.3	16.3

*Note:* Dollar amounts are inflation adjusted to 2017 dollars. Sample size: 297 museums, 787 universities, 366 hospitals, 620 K-12 schools.

### 6.3.1 | Endowment fund size

By both mean and median of endowment beginning balance, universities have the largest endowment funds (Mean = 393 M, Med = 49.3 M). In comparison, hospitals (Mean = 82.4 M, Med = 11.1 M), museums (Mean = 56.7 M, Med = 7.9 M), and K-12 schools (Mean = 31.8 M, Med = 9.3 M) have much smaller endowment funds. The large standard deviations indicate that endowment size also varies drastically within each type of organizations.

From another angle, the endowment-to-expense ratio measures the relative size of an endowment fund to organizational total expenses. Museums have the largest mean and median endowment-to-expense ratio (Mean = 3.37, Med = 2.45), while hospital have the smallest ratio (Mean = 0.21, Med = 0.04). Universities (Mean = 1.14, Med = 0.68) and K-12 schools (Mean = 1.19, Med = 0.72) have similar levels of endowment-to-expense ratio.

### 6.3.2 | Endowment payout

Hospitals have the highest average payout rate but the median rate is similar to that of universities and K-12 schools (Mean = 9.0%, Med = 4.3%). Museums have the second largest average payout rate and the largest median value (Mean = 6.2%, Med = 4.9%), followed by K-12 schools (Mean = 5.5%, Med = 4.3%). Universities have the lowest average payout rate (Mean = 4.8%, Med = 4.3%). By dollar amounts, however, universities have the largest mean and median payout amounts, leading hospitals, museums, and K-12 schools.

Payout-to-expense ratio provides another indicator of endowment payout behavior. It measures the relative importance of endowment distributions to an organization's total expenses, and demonstrates the dependence on endowment payout for operating budget (Calabrese & Ely, 2017). Museums apparently are the most reliant on endowment payouts among all types of organizations (Mean = 0.20, Med = 0.13) and hospitals are the least reliant (Mean = 0.01, Med = 0.002). Universities and K-12 schools have similar mean and median payout-to-expense ratio (Mean = 0.06, Med = 0.03).

### 6.3.3 | Endowment returns

Universities have the largest mean and median returns (Mean = 8.0%, Med = 9.2%), followed by K-12 schools (Mean = 7.6%, Med = 8.6%) and museums (Mean = 7.5%, Med = 7.6%),



whereas hospitals have the smallest returns (Mean = 6.1%, Med = 4.7%). The different levels of investment returns across types of organizations are likely to be driven by their asset allocation strategy (Qu, 2020).

### 6.3.4 | Contributions to endowment

By the relative size of contributions to endowment (i.e., percentage of endowment beginning balance), hospitals have the largest mean percentage of contributions to endowment (Mean = 11.2%, Med = 2.7%), followed by K-12 schools (Mean = 6.2%, Med = 1.9%), and museums that have the smallest median percentage (Mean = 5.6%, Med = 0.6%). A significant proportion of these organizations receive no contributions in certain years. Finally, universities have the smallest mean percentage of contributions to endowment but a comparatively high median value (Mean = 4.9%, Med = 2.4%), with most universities regularly receiving contributions to their endowments every year.

### 6.3.5 | Organizational operations

Turning to the operational side, Table 2 also reported summary statistics of non-endowment income, total expenses, as well as the growth rates of non-endowment income. The average non-endowment income growth rates range from 2.0% for universities (Med = 1.9%) to 2.6% for K-12 schools (Med = 1.9%). By median values, however, hospitals have the largest growth rates (Med = 2.5%, Mean = 2.4%), whereas museums have the smallest growth rates (Med = 1.3%, Mean = 2.4%). Hospitals also have the highest mean and median non-endowment income (Mean = 565 M, Med = 312 M) and total expenses (Mean = 545 M, Med = 300 M), with universities in the second place (Mean income = 213 M, Med income = 72 M; Mean expenses = 229 M, Med expenses = 75 M). K-12 schools and museums have much smaller non-endowment income and total expenses.

### 6.3.6 | Summary

These descriptive statistics highlight important differences in endowment funds and operations across types of organizations. First, compared to other types of organizations, museums have smaller endowment funds. They also have the smallest non-endowment income and total expenses. However, museums appear to be the most reliant on endowment payouts to fund their total expenses among all. Their median payout rate is close to 5%, higher than other types of organizations.

Second, universities have larger endowment funds and better investment performance than other types of organizations. Most universities receive contributions to their endowments every year. Universities also have relatively large non-endowment income and total expenses (second to hospitals). Compared to others, university endowments pay out more dollar amounts but not in terms of payout rates.

Third, hospitals are the least reliant on endowment payouts to fund total expenditures. Hospitals also have the lowest investment performance compared to other types of organizations, possibly due to more conservative investment strategies. In addition, hospitals have the largest

non-endowment income and total expenses. Although the median payout rate is similar to that of universities and K-12 schools, hospitals have the largest average payout rate, suggesting very high payout rates by some organizations. Note that many hospitals rely on debt to support their capital expenditures (e.g., equipment, facilities) and have a focus on maintaining liquidity and bond ratings required by the rating agencies (Commonfund Institute, 2018b). This may affect the both endowment investment and spending by hospitals.

Lastly, K-12 schools are much smaller institutions with the smallest endowment funds and relatively small non-endowment income and total expenses. However, some endowment characteristics of K-12 schools are similar to those of universities. For example, they have a similar mean and median endowment-to-expense ratio. They also have a similar level of dependence on endowment payouts for total expenditures. The median payout rate is the same for both, but K-12 schools have higher average payout rates.

The different characteristics of endowments and organizational operations may imply different relations between endowment spending and endowment investment performance, non-endowment operating income, as well as contributions to endowment. Therefore, the following regression analyses separately examine each type of organizations.

## 7 | REGRESSION RESULTS: CHANGES IN ANNUAL ENDOWMENT PAYOUT RATES

Table 3 reports results from the fixed-effects specifications, which examine if changes in annual endowment payout rates are related to contemporaneous and lagged changes in endowment returns, non-endowment income growth rates, and contributions to endowment. The regressions include both year and organizational fixed effects. Standard errors are clustered by organization to allow for correlations among observations of a given organization over time. All models are statistically significant.

### 7.1 | Endowment returns

The payout responses to endowment returns differ by type of organizations. Museums ( $\beta = .10$ ,  $p < .05$ ) experiencing higher-than-average contemporaneous positive returns have higher annual payout rates. The coefficient on contemporaneous negative returns is also positive, although not significant. Universities ( $\beta = -.05$ ,  $p < .05$ ) with higher positive returns in the prior year have lower annual payout rates. This is possible if the majority of the sample uses the moving-average method that is based on prior endowment values. As reviewed previously, this method is associated with higher payout rates in declining markets (via decreasing endowment value) and lower payout rates in rising market (via increasing endowment value). The coefficient on lagged negative returns is also negative but not significant. For K-12 schools, the coefficient on lagged negative returns is significant and negative ( $\beta = -.13$ ,  $p < .05$ ), suggesting that organizations experiencing lower negative returns in the prior year have higher payout rates. It is also worth mentioning that when examining returns without decomposing into negative and positive parts, the coefficient on lagged returns is not significant (Supporting Information). A post-estimation test further shows that positive and negative returns have significantly different relationships with endowment payout rates ( $p < .05$ ), indicating asymmetric endowment payout responses to positive and negative endowment returns.

**TABLE 3** Fixed effects regressions on annual endowment payout rates

	Museums	Universities	Hospitals	K-12 schools
Positive endowment returns $s_{i,t}$	0.104** (0.0473)	0.00971 (0.0335)	0.0393 (0.0442)	−0.0335 (0.0330)
Negative endowment returns $s_{i,t}$	0.0812 (0.0960)	0.0375 (0.0522)	−0.00293 (0.164)	0.0382 (0.0435)
Positive endowment returns $s_{i,t-1}$	0.0115 (0.0289)	−0.0468** (0.0190)	−0.0473 (0.0348)	0.00116 (0.0274)
Negative endowment returns $s_{i,t-1}$	0.102 (0.113)	−0.0233 (0.0403)	0.101 (0.191)	−0.130** (0.0579)
Positive revenue growth $i_{i,t}$	−0.00713 (0.00558)	0.00861 (0.00602)	−0.00698 (0.0274)	0.00594 (0.00616)
Negative revenue growth $i_{i,t}$	−0.00345 (0.00480)	0.0182*** (0.00661)	0.0713 (0.0512)	0.0159 (0.0105)
Positive revenue growth $i_{i,t-1}$	−0.00606 (0.00376)	−0.000663 (0.00479)	0.00715 (0.0333)	0.00457 (0.00696)
Negative revenue growth $i_{i,t-1}$	−0.00205 (0.00427)	0.00814 (0.00914)	−0.0329 (0.0309)	0.0126 (0.00991)
Contributions to endowment $i_{i,t}$	0.00218 (0.00780)	−0.00866* (0.00481)	0.0489** (0.0198)	0.0292** (0.0133)
Contributions to endowment $i_{i,t-1}$	−0.00936* (0.00559)	−0.0103*** (0.00363)	0.0123 (0.0185)	−0.00547 (0.00587)
Year and organization fixed effects	Yes	Yes	Yes	Yes
Constant	0.0519**** (0.00548)	0.0500**** (0.00354)	0.0649**** (0.00610)	0.0530**** (0.00429)
Joint $p$ value of endowment returns	.0141**	.0002****	.5797	.0610*
Joint $p$ value of revenue growth	.5166	.0773*	.1938	.3268
Joint $p$ value of contributions to endowment	.1934	.0186**	.0443**	.0588*
Model $p$ value	.0016***	.0000****	.0087***	.0000****
Observations	1,409	4,273	1869	3,136
Number of organizations	297	787	366	620

*Note:* The dependent variable is the annual endowment payout rates between 2010 and 2016. Year and organization fixed effects are included. Robust standard errors are clustered by organization, shown in parentheses.

\* $p < 0.10$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ .

\*\*\*\* $p < 0.001$ .

Finally, the results on endowment returns for hospitals are not statistically significant. The coefficient estimates for the contemporaneous and lagged positive and negative returns are significant for museums ( $p < .05$ ) and universities ( $p < .001$ ), and marginally significant for K-12 school ( $p < .10$ ), but not significant for hospitals ( $p > .10$ ). Therefore, except for

hospitals, Hypothesis 1 (null hypothesis) is rejected for the other three types of organizations at 5% or 10% level.

## 7.2 | Operating income

The endowment payout response to changes in non-endowment income growth rates is small, if any. Specifically, universities ( $\beta = 0.02$ ,  $p < .01$ ) have lower (higher) payout rates when experiencing lower (higher) contemporaneous negative income growth. The coefficients on the non-endowment income growth variables are not significant for other types of organizations. The coefficient estimates for the contemporaneous and lagged positive and negative revenue growth are marginally significant for universities ( $p < .10$ ) but not significant for others ( $p > .10$ ). Therefore, Hypothesis 2 (null hypothesis) is rejected for universities at the 10% level but not for other types of organizations.

## 7.3 | Contributions to endowment

The changes in annual payout rates for museums are negatively associated with lagged changes in contributions to endowments, although the relation is small and only marginally significant ( $\beta = -.009$ ,  $p < .10$ ). Similarly, for universities, the payout rates slightly decrease with increasing contributions to endowments in the previous year ( $\beta = -.010$ ,  $p < .01$ ), and the result is marginally significant for contemporaneous changes ( $\beta = -.009$ ,  $p < .10$ ). This is possible when contributions to an endowment increase the size of the endowment and the policy payout rate remains unchanged. In contrast, the changes in payout rates are positively associated with contemporaneous changes in contributions to endowments for both hospitals ( $\beta = .049$ ,  $p < .05$ ) and K-12 schools ( $\beta = .029$ ,  $p < .05$ ), with larger magnitudes. This is likely when contributions to endowments are pass-through gifts that are used for current-year operations rather than as restricted gifts. The coefficient estimates for the contemporaneous and lagged contributions to endowment are significant universities ( $p < .05$ ) and hospitals ( $p < .05$ ), and marginally significant for K-12 school ( $p < .10$ ), but not significant for museums ( $p > .10$ ). Therefore, Hypothesis 3 (null hypothesis) is rejected for all types of organizations but museums. Table 4 summarizes

**TABLE 4** Hypothesis testing results

Null hypothesis	Museums	Universities	Hospitals	K-12 schools
H1	Rejected ( $p < .05$ )	Rejected ( $p < .001$ )	Not rejected ( $p > .10$ )	Rejected ( $p < .10$ )
H2	Not rejected ( $p > .10$ )	Rejected ( $p < .10$ )	Not rejected ( $p > .10$ )	Not rejected ( $p > .10$ )
H3	Not rejected ( $p > .10$ )	Rejected ( $p < .05$ )	Rejected ( $p < .05$ )	Rejected ( $p < .10$ )

*Note:* Reported in the parenthesis are p values from joint tests of coefficients on each set of independent variables.

the hypothesis testing results by type of nonprofits based on joint tests of corresponding variables.

## 8 | DISCUSSION

The descriptive results demonstrate cross-sectional differences in endowment funds and organizational operations both across and within each type of organizations. Moreover, in the initial sample, the annual payout rates spread from 0 to nearly 100% of the year-end endowment value during the period of 2009 and 2016. This supports the finding by Brown and Tiu (2014), who note a substantial increase in the sample-wide variation in payout rates among universities after 2008. This study also finds that organizations paying out nothing from their endowments mostly have small funds, consistent with the finding by Dahiya and Yermack (2018).

The post-recession period between 2009 and 2016 also witnesses some within-organization variations in endowment spending. What drives an organization's annual payout rates to deviate from its expected level (i.e., organizational average level)? The answers vary by type of organizations. The annual payout rates of museums increase with higher-than-expected contemporaneous positive endowment returns. In contrast, hospitals, with relatively lower investment returns and volatility, as well as lower dependence on endowment spending on average, do not seem to adjust payout rates responding to changes in endowment returns.

Both universities and K-12 schools appear to respond to lagged changes in endowment returns, but in different ways. For K-12 schools, the payout rates increase following lower-than-expected negative returns in the prior year but remain unchanged following changes in positive returns. In contrast, the payout rates of universities decrease slightly with higher lagged positive returns. This finding is partly consistent with prior research on university endowment spending between 1993 and 2009. For example, Brown et al. (2014) reports a negative and significant effect of lagged positive endowment shocks on payout rates. However, the finding does not support the endowment hoarding objective suggested by Brown et al. (2014).

As to non-endowment income growth rates, the only significant result is found among universities, but indicates that those with lower-than-expected contemporaneous negative income growth have lower endowment payout rates. The results are not significant for other types of organizations. Admittedly, the period between 2009 and 2016 is less turbulent than a period that includes recessions. Nonetheless, over a third of the organization-year observations experienced negative non-endowment income growth rates. The findings offer little support for the rainy-day-fund objective, which posits that an endowment serves as a buffer against overall financial shocks.

Finally, contributions to endowment seem to play different roles for different types of organizations. For museums and universities, contributions to endowment may be mostly restricted gifts that help grow the endowment assets. For hospitals and K-12 schools, contributions to endowment may be mostly used to support to current expenditures. This may explain the high payout rates at the top quartile for hospitals. In addition, without controlling for contributions to endowment, the coefficient on contemporaneous negative non-endowment income growth rates is significantly negative for K-12 schools. However, the result reduces to non-significant after controlling for contributions to endowment. This may suggest that unrestricted donations to endowment helps cushion negative revenue changes and smooth out endowment spending.

This study takes advantage of the recently available data on nonprofit endowments from the IRS Form 990 Schedule D. Before the IRS redesigned the Form 990 in 2008, endowment information was not available. Scholars studying endowment behavior used various proxy measures

of endowment balance and the results were not directly comparable (Calabrese & Ely, 2017). University endowments have received the most scholarly attention, partly benefiting from the NACUBO endowment survey data since the 1980s. However, the other types of operating public charities that also hold endowments are largely understudied. The new endowment data provide opportunities to examine endowment spending empirically and compare other types of nonprofits with universities.

Admittedly, there are issues remain unanswered from the current data. First, Form 990 does not include information on the endowment spending rules and policy payout rates. Knowing this information would help us to better understand when, how, and why organizations deviate from their policy payout rates. Second, a question of policy interest is how endowments respond to financial shocks. The estimation of exogenous shocks requires data that covers a long time period but the e-filer data are only available since 2009. As more years' data become available (especially the data during and following the pandemic), future research will be able to better observe the time-varying patterns of endowment spending. As for now, this study remains the first attempt to examine within-organization variations of endowment spending for operating public charities beyond universities.

## 9 | CONCLUSION

There has been growing public attention on the use of endowment assets, especially since the 2008 recession. Facing the current COVID-19 pandemic, endowed nonprofits are confronted with the problem on whether they should tap more heavily into endowment spending to avoid budget cuts. This reflects an ongoing inquiry on the purpose of endowments, particularly, should endowments be treated as rainy day funds? Much of the literature has been on how endowments *should* be spent, but less is on how endowments are *actually* spent. This study provides empirical evidence on endowment spending behavior. It highlights heterogeneity in endowment characteristics across four types of operating charities that hold considerable endowment assets in the nonprofit sector, including museums, universities, hospitals, and K-12 schools. It shows that different types of organizations have different payout responses to changes in endowment returns, other operating income, and contributions to endowment. However, it does not find evidence that supports the rainy-day-fund objective. Additionally, it shows that the contributions to endowment play different roles for different types of organizations, either as restricted funds that grow endowment assets or as alternative funding that supports current expenditure. Hence, additional to the current debate on the role and use of endowment funds as rainy funds, endowment management may also need to separately consider developing non-restricted donations to endowment that may help smooth endowment spending.

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## ENDNOTES

- <sup>i</sup> An exception is when an organization spends a fixed percentage of the endowment value specified in the policy. In this case, the effective spending rate is the same as the policy rate. The rate does not change annually but spending dollars do.
- <sup>ii</sup> For Line 1 items on Schedule D Part V, nonprofits can report up to 4 years back besides the current year. The historical data, if available, are used to replace missing values and verify reported values in prior years.
- <sup>iii</sup> The public benefit subsector also represented a large share of the cleaned sample (19%). However, this subsector is dominated by local chapters of YMCA, YWCA, YMHA, and YWHA, and so was excluded from the analysis.
- <sup>iv</sup> Brown et al. (2014) used revenue from the government to construct their revenue shock variables. They also noted that the results were essentially unchanged when including all revenue sources to construct their revenue shock variables.
- <sup>v</sup> Other alternative funding includes disinvesting quasi-endowments or borrowing. However, these variables are potentially endogenous variables and so cannot be included in the model.
- <sup>vi</sup> The model does not control for organizational size because it might be jointly determined with endowment payout rates. Nonetheless, alternative analyses that include lagged log of total assets show that the main results are qualitatively similar while assets are not significant.
- <sup>vii</sup> Organizations with very high (top 1%) or low (bottom 1%) standard deviations of endowment returns, or very high standard deviations of non-endowment income growth rates were excluded. Several organizations with extremely large contributions to their endowments (e.g., over 500%) were also excluded.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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